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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,242	03/12/2004	Young Hoon Park	YPL-0087	8843

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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/800,242	PARK ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/28/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (WO 03/009352) in view of Mizuno (USPat. 6085690). Park teaches a thin film deposition reactor (100; Figure 3; Page 8, lines 11-32) comprising: a reactor block (110; Figure 3; Page 8, lines 11-32) comprising a wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32) on which a wafer (W; Figure 3) is mounted; a top lid (130; Figure 3; Page 8, lines 11-32) for covering and sealing the reactor block (110; Figure 3; Page 8, lines 11-32); a showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) disposed under the top lid (130; Figure 3; Page 8, lines 11-32) and connected to an RF power supply unit (150; Figure 3; Page 8, lines 11-32), the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) having first nozzles (142c; Figure 12; page 11, lines 13-25) and second nozzles (141c; Figure 12; page 11, lines 13-25) that are not combined with each other; a top lid (130; Figure 3; Page 8, lines 11-32) isolation flow line (121a, 122a; Figure 3; Page 8, lines 11-32) disposed on the top lid (130; Figure 3; Page 8, lines 11-32), the top lid (130; Figure 3; Page 8, lines 11-32) isolation flow line (121a, 122a; Figure 3; Page 8, lines 11-32) having a first flow line (121a; Figure 3; Page 8, lines 11-32) and a second flow line (122a; Figure 3; Page 8, lines 11-32), which are connected to the first nozzles (142c; Figure 12; page 11, lines 13-25) and the second nozzles (141c; Figure 12;

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page 11, lines 13-25), respectively, and are each bent at a right angle at least once (see Figure 12)

– claim 1

Park further teaches:

- i. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 1, further comprising a circular pumping baffle (not labelled; bulb volume in 110 Figure 3) that protects the inner surface of the reactor (100; Figure 3; Page 8, lines 11-32) from erosive reaction gases and, together with the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) and the wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32), defines a deposition space, wherein the pumping baffle (not labelled; bulb volume in 110 Figure 3) comprises a vertical portion (not labelled; vertical part of bulb volume in 110 Figure 3) disposed in an upper portion of the reactor block (110; Figure 3; Page 8, lines 11-32) and a horizontal portion (not labelled; horizontal part of bulb volume in 110 Figure 3) disposed in a lower portion of the reactor block (110; Figure 3; Page 8, lines 11-32) and having pumping holes (not labelled; holes above bulb volume in 110 Figure 3), as claimed by claim 4
- ii. A thin film deposition reactor (100; Figure 3; Page 8, lines 11-32) comprising: a reactor block (110; Figure 3; Page 8, lines 11-32) comprising a wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32) on which a wafer (W; Figure 3) is mounted; a top lid (130; Figure 3; Page 8, lines 11-32) for covering and sealing the reactor block (110; Figure 3; Page 8, lines 11-32), a showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) disposed under the top lid (130; Figure 3; Page 8, lines 11-32) and connected to an RF power supply unit (150; Figure 3; Page 8, lines 11-32), the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11,

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lines 13-25) having first nozzles (142c; Figure 12; page 11, lines 13-25) and second nozzles (141c; Figure 12; page 11, lines 13-25) that are not combined with each other (Figure 12) and; a top lid (130; Figure 3; Page 8, lines 11-32) isolation flow line (121a, 122a; Figure 3; Page 8, lines 11-32) disposed on the top lid (130; Figure 3; Page 8, lines 11-32), the top lid (130; Figure 3; Page 8, lines 11-32) isolation flow line (121a, 122a; Figure 3; Page 8, lines 11-32) having a first flow line (121a; Figure 3; Page 8, lines 11-32) and a second flow line (122a; Figure 3; Page 8, lines 11-32), which are connected to the first nozzles (142c; Figure 12; page 11, lines 13-25) and the second nozzles (141c; Figure 12; page 11, lines 13-25), respectively, and are each bent at a right angle at least once (See Figure 12) – claim 5

- iii. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 5, further comprising a circular pumping baffle (not labelled; bulb volume in 110 Figure 3) (not labelled; bulb volume in 110 Figure 3) that protects the inner surface of the reactor (100; Figure 3; Page 8, lines 11-32) from erosive reaction gases and, together with the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) and the wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32), defines a deposition space, wherein the pumping baffle (not labelled; bulb volume in 110 Figure 3) comprises a vertical portion (not labelled; vertical part of bulb volume in 110 Figure 3) disposed in an upper portion of the reactor block (110; Figure 3; Page 8, lines 11-32) and a horizontal portion (not labelled; horizontal part of bulb volume in 110 Figure 3) disposed at a lower portion of the reactor block (110; Figure 3; Page 8, lines 11-32) and having pumping holes (not labelled; holes above bulb volume in 110 Figure 3), as claimed by claim 8

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Park does not teach:

- i. a showerhead isolation assembly having a plurality of gas curtain holes for forming a gas curtain around the wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32), the showerhead isolation assembly for isolating the top lid (130; Figure 3; Page 8, lines 11-32) from the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) – claim 1
- ii. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 1, wherein the showerhead isolation assembly comprises: a first showerhead assembly disposed between the top lid (130; Figure 3; Page 8, lines 11-32) and the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25); and a second showerhead assembly which encloses an outer circumference of the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) and has a plurality of gas curtain holes that are connected to a third flow line formed in the top lid (130; Figure 3; Page 8, lines 11-32), as claimed by claim 2
- iii. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 2, further comprising a reactor block (110; Figure 3; Page 8, lines 11-32) isolation flow line mounted on the reactor block (110; Figure 3; Page 8, lines 11-32), the reactor block (110; Figure 3; Page 8, lines 11-32) isolation flow line having first, second, and third reactor flow lines, which are connected to the first, second, and third flow lines, respectively, and are each bent at a right angle at least once, as claimed by claim 3
- iv. the top lid (130; Figure 3; Page 8, lines 11-32) having a plurality of gas curtain holes for forming a gas curtain around the wafer (W; Figure 3) block (120; Figure 3; Page 8, lines 11-32) and a third flow line connected to the gas curtain holes – claim 5

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- v. a showerhead isolation assembly for isolating the top lid (130; Figure 3; Page 8, lines 11-32) from the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25) – claim 5
- vi. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 5, wherein the showerhead isolation assembly comprises: a first showerhead assembly disposed between the top lid (130; Figure 3; Page 8, lines 11-32) and the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25); and a second showerhead assembly that encloses an outer circumference of the showerhead (140; Figure 3, 12; Page 8, lines 11-32; page 11, lines 13-25), as claimed by claim 6
- vii. The reactor (100; Figure 3; Page 8, lines 11-32) of claim 5, further comprising a reactor block (110; Figure 3; Page 8, lines 11-32) isolation flow line mounted on the reactor block (110; Figure 3; Page 8, lines 11-32), the reactor block (110; Figure 3; Page 8, lines 11-32) isolation flow line having first, second, and third reactor flow lines, which are connected to the first, second, and third flow lines, respectively and are each bent at a right angle at least once, as claimed by claim 7

Mizuno teaches a showerhead isolation mechanism (31; Figure 1) including a reactor block (11; Figure 1) isolation flow line (27) mounted on the reactor block (11; Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Mizuno teaches a showerhead isolation mechanism including additional processing gas delivery lines.

Motivation to add Mizuno teaches a showerhead isolation mechanism including additional processing gas delivery lines is for preventing process gases from entering “dead space” (column

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5, line 65 – column 6, line 22). It is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

Prof Zervigon
2/21/6